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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,194	06/11/2001	Richard J. Deslauriers		1225

7590 12/29/2004

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WOLCOTT, CT 06716

EXAMINER

PENDLETON, BRIAN T

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**RECEIVED**  
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Technology Center 2600

**Office Action Summary**

Application No.

09/877,194

Applicant(s)

DESLAURIERS ET AL.

Examiner

Brian T. Pendleton

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 and 2 is/are allowed.
- 6) ☒ Claim(s) 3-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recited that the battery holder is adapted to utilize any conventional or custom designed battery source. Use of the word “any” renders the claims indefinite as it is impossible for the battery holder to be constructed to accommodate all the different sizes and shapes of known batteries, whether they be standard or customized.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Dieken et al, US Patent 5,367,575. Dieken discloses a battery holder 40 which is to be inserted into stethoscope chestpiece 12 (within a shell of a stethoscope). The battery holder 40 is in the direct path of sound energy. The battery holder is sized to retain the functional and aesthetic appearance of a standard stethoscope shell as shown in figures 1 and 6.

5. Claims 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by McLaughlin, US Patent 5,638,453. In figure 5, McLaughlin discloses a stethoscope comprising a battery holder 52 having a coin shaped battery 48 (per claim 4) which is located on the bottom of the stethoscope. It is sized to retain the functional and aesthetic appearance of the stethoscope and is located within the shell of the stethoscope.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazawa et al, GB 2 115 934 in view of Walshe, US Patent 4,254,302. Yamazawa et al disclose a stethoscope comprising battery holder 14 and battery 9 which are retained through manually attachable elements 1 and 2 and positioned directly under electrode 7 which is used to measure pulse rate. The electrode 7 thereby reads on a hard or soft diaphragm of a stethoscope. Yamazawa et al do not disclose a plurality of batteries. Walshe discloses a electronic stethoscope comprising a plurality of batteries 190, 191 in a compartment 194. Thus, it was well known that stethoscopes were powered with more than one battery. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the Yamazawa invention to handle a plurality of batteries since it was well known to have more than one battery for the purpose of supplying more power to the stethoscope.

***Allowable Subject Matter***

8. Claims 1 and 2 are allowed.

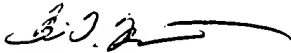
*Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pfeiffer, US Patent 4,071,694.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
btp

  
XU MEI  
PRIMARY EXAMINER

**Notice of References Cited**

Application/Control No.

09/877,194

Applicant(s)/Patent Under

Reexamination

DESLAURIERS ET AL.

Examiner

Brian T. Pendleton

Art Unit

2644

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-4,071,694	01-1978	Pfeiffer, G. William	381/67
	B	US-5,367,575	11-1994	Dieken et al.	381/67
	C	US-4,254,302	03-1981	Walshe, James C.	381/67
	D	US-5,638,453	06-1997	McLaughlin, Bruce E.	381/67
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	GB 2115934 A	09-1983	United Kingdom	YAMAZAWA et al.	A61B 05/02
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

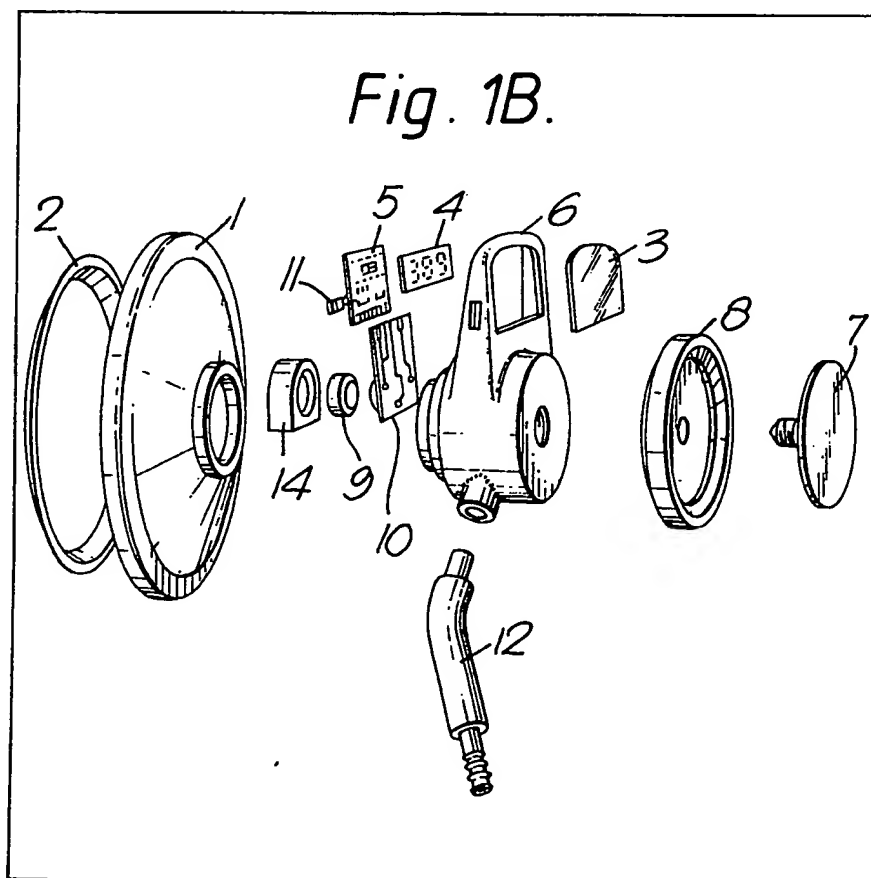
\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

(12) UK Patent Application (19) GB (11) 2 115 934 A

- (21) Application No 8304887  
(22) Date of filing 22 Feb 1983  
(30) Priority data  
(31) 57/031215  
(32) 26 Feb 1982  
(33) Japan (JP)  
(43) Application published  
14 Sep 1983  
(51) INT CL<sup>3</sup>  
A61B 5/02  
(52) Domestic classification  
G1N 19B2P 19D10 19X7  
30P1 30P2 30P3 ECG  
(56) Documents cited  
GB 1454066  
GB 1158629  
(58) Field of search  
G1N  
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(54) Stethoscope

(57) A stethoscope has an electrically conductive resonant plate (2) arranged to contact the chest or other part of a human body, a support structure (6) on which the resonant plate is mounted and an electrode (7) mounted on the support structure but electrically insulated from the resonant plate. The electrode is arranged to be touched by a finger or other part of the human body. A pulse rate measuring circuit (Figure 3) is connected to receive an electrocardiac potential signal induced between the resonant plate and the electrode for measuring heart or pulse rate. The heart or pulse rate is determined from the interval between pulses. A display device (4) displays the heart or pulse rate.



GB 2 115 934 A

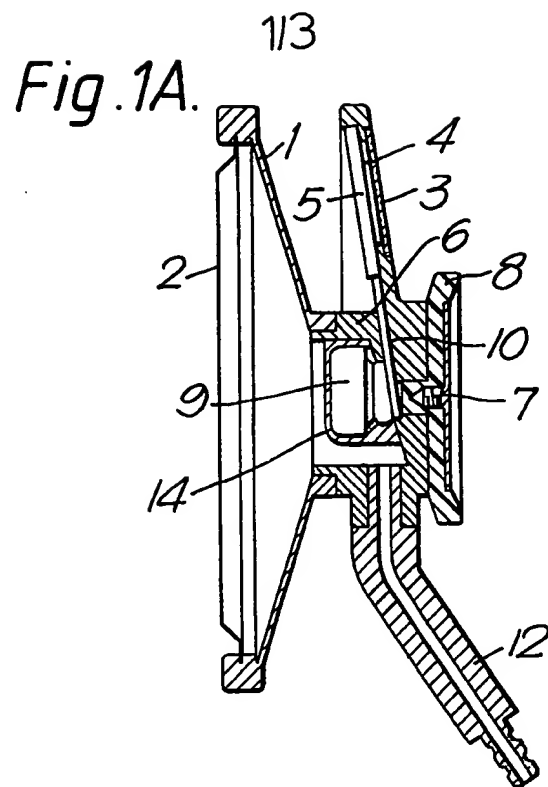


Fig. 1B.

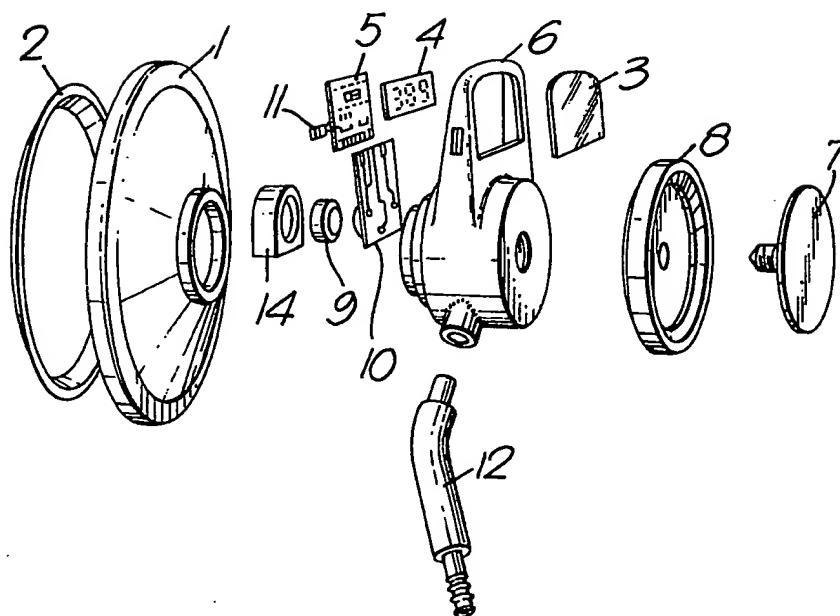




Fig. 2.

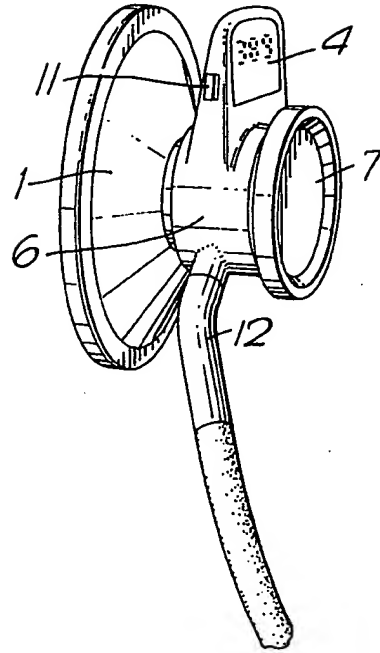


Fig. 4.

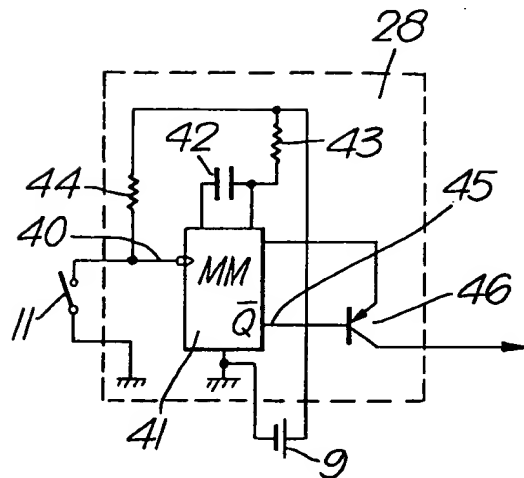
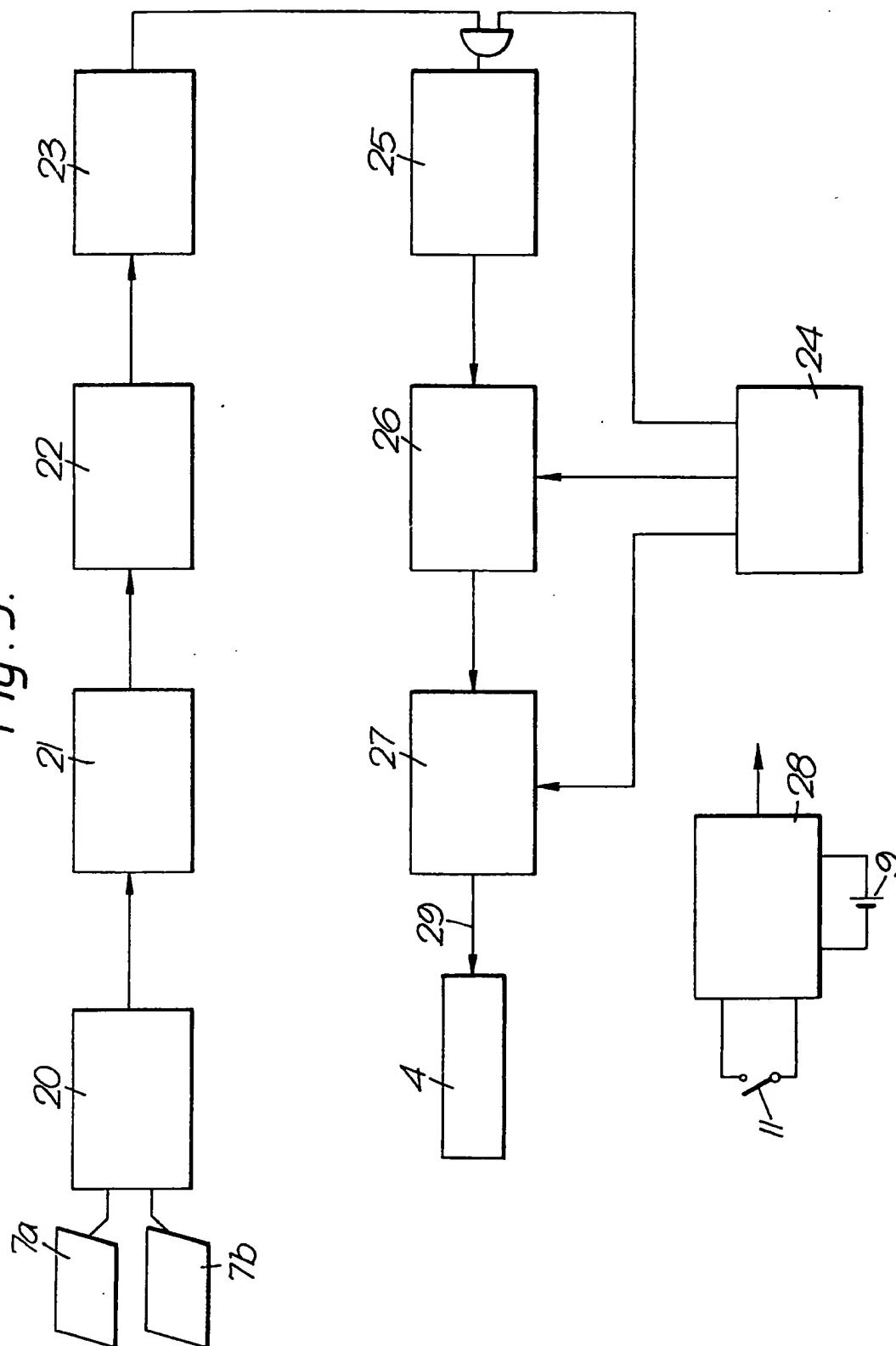


Fig. 3.



## SPECIFICATION

### Stethoscope

5 This invention relates to stethoscopes.

According to the present invention there is provided a stethoscope having an electrically conductive resonant plate arranged to contact the chest or other part of a human body, support structure on which the resonant plate is mounted, an electrode mounted on the support structure but electrically insulated from the resonant plate, the electrode being arranged to be touched by a finger or other part of the human body, a pulse rate measuring circuit connected to receive an electrocardiac potential signal induced between the resonant plate and the electrode for measuring heart or pulse rate, and a display device for displaying the heart or pulse rate.

20 The resonant plate may be connected electrically through a stethoscope body to the pulse rate measuring circuit.

In the preferred embodiment the pulse rate measuring circuit is mounted on a circuit board located in the support structure between the resonant plate and the electrode.

The display device is preferably mounted in the support structure.

30 The stethoscope preferably includes a battery located in the support structure between the resonant plate and the electrode.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:-

35 *Figure 1A* is a sectional view of one embodiment of a stethoscope according to the present invention;

*Figure 1B* is an exploded view of the stethoscope of *Figure 1A*;

*Figure 2* is a perspective view of the stethoscope of *Figure 1A*;

40 *Figure 3* is a block diagram of an electronic pulse rate measuring circuit of the stethoscope of *Figure 1A*; and

*Figure 4* is a circuit diagram of an automatic power circuit of the electronic pulse rate measuring circuit of *Figure 3*.

Figure 1A illustrates one embodiment of a stethoscope according to the present invention and Figure 1B is an exploded view thereof. A stethoscope body 1 and a resonant plate 2 are made of metal so that they can be brought into electrical contact with the chest or other part of a patient. An electronic pulse rate measuring circuit described in greater detail later with reference to Figure 3 and 4 is mounted on a circuit board 5 connected with a display panel 4.

55 The circuit board 5, the display panel 4, a conduit 12, a cover glass 13 for the display panel, a battery cover 14 and a battery 9 are mounted on a support structure 6. An electrode 7 is electrically insulated from the support structure 6 by an electrically insulating member 8 made of, for example, synthetic resin.

60 In operation, the resonant plate 2 is applied to the patient's chest and the electrode 7 is touched by the patient's fingertip. The electronic pulse rate measuring circuit measures heart or pulse rate.

electrocardiac potential signal induced between the resonant plate 2 and the electrode 7. The heart or pulse rate is displayed by the display panel 4. The electrode 7, the circuit board 5 and the battery 9 are connected by a wiring board 10. The battery 9 can be replaced by detaching the battery cover 14 after removing the stethoscope body 1 from the support structure 6.

70 Figure 2 is a perspective view of the stethoscope of Figure 1A showing the support structure 6 housing the display panel 4 which displays the heart or pulse rate, a power switch 11, the electrode 7, and a rubber tube 13 inserted over the conduit 12. The pulse rate measuring circuit becomes operative by turning the power from the battery 9 on by closing the power switch 11. The power is turned off automatically after a predetermined time.

80 The drawings only show part of one embodiment of a stethoscope according to the present invention, the parts, for example, ear pieces, which are not shown are those necessary to permit the stethoscope to be used by a doctor or nurse in the conventional manner.

Figure 3 is a block diagram of the pulse rate measuring circuit of the stethoscope of Figure 1A. An electrode 7a corresponds to the electrode 7 and an electrode 7b corresponds to the resonant plate 2. The electrodes 7a, 7b are connected to a pre-amplifier 20 which amplifies the electrocardiac potential signal to improve the signal-to-noise ratio. An output signal from the preamplifier 20 is fed to a band-pass filter 21 to eliminate unnecessary frequency components outside the expected frequency range of the electrocardiac potential signal. An output signal from the band-pass amplifier 21 is amplified by a main amplifier 22. An output signal from the main amplifier is fed to a level detector 23 to provide a pulsiform signal derived from the electrocardiac potential signal. The pulsiform signal from the level detector 23 switch a gate 30 of a counter 25.

100 A clock signal from a clock generator 24 is also applied to the gate of the counter 25. The value counted by the counter 25 is directly proportional to the interval between the pulses of the pulsiform signal from the level detector 23. Namely, the value counted by the counter 25 is directly proportional to the period of the pulsiform signal. The value counted by the counter 25 is then fed to a counting circuit 26 which produces an output signal proportional to the member of pulses/minute. The output signal from the counting circuit is converted into a segment data signal 29 by a decoder 27 and fed to the display panel 4 to display heart or pulse rate as a number of beats per minute. The clock signal from the clock generator 24 is supplied to the counting circuit 26 and the decoder 27.

110 An automatic power circuit 28 controls the power supplied from the battery 9 to the electronic pulse rate measuring circuit so that after the power switch 11 has been pressed once power is applied to the pulse rate measuring circuit for a predetermined period of time and then the power is automatically turned off. As shown in Figure 4 the automatic power circuit includes a mono-stable multi-vibrator

41 which can be triggered to enable the electronic pulse rate measuring circuit to start counting pulses at any time. Since the power switch 11 need not be opened manually and since the power is turned off automatically after a predetermined period of time, consumption of the battery is reduced. The automatic power circuit 28 has a capacitor 42 for determining the predetermined period of time power is applied to the pulse rate measuring circuit after the power switch 11 has been pressed, a register 43, a pull-up resistor 44 connected to an input terminal 40 for triggering the mono-stable multi-vibrator 41 when the power switch 11 is closed, and a transistor 46 which is a power source switch controlled by a signal at an output terminal 45 of the mono-stable multi-vibrator 41. The transistor 46 remains conductive for a predetermined period of time to provide power to the electronic pulse rate measuring circuit.

The stethoscope according to the present invention and illustrated above includes an electronic pulse rate measuring circuit producing an indication of heart or pulse rate from the electrocardiac potential signal between the patient's chest and fingertip. Thus, examination of a patient by the stethoscope and counting of heart or pulse rate are simultaneously performed so that examination time is reduced, patient fatigue is relieved and doctors or nurses labour reduced. The position of the display panel 4 in the support structure 6 is such that the heart or pulse rate can be seen by the doctor or nurse whilst the patient's chest or other part of the body is being examined by the stethoscope in the conventional manner.

### 35 CLAIMS

1. A stethoscope having an electrically conductive resonant plate arranged to contact the chest or other part of a human body, a support structure on which the resonant plate is mounted, an electrode mounted on the support structure but electrically insulated from the resonant plate, the electrode being arranged to be touched by a finger or other part of the human body, a pulse rate measuring circuit connected to receive an electrocardiac potential signal induced between the resonant plate and the electrode for measuring heart or pulse rate, and a display device for displaying the heart or pulse rate.
2. A stethoscope as claimed in claim 1 in which the resonant plate is connected electrically through a stethoscope body to the pulse rate measuring circuit.
3. A stethoscope as claimed in claim 1 or 2 in which the pulse rate measuring circuit is mounted on a circuit board located in the support structure between the resonant plate and the electrode.
4. A stethoscope as claimed in any preceding claim in which the display device is mounted in the support structure.
5. A stethoscope as claimed in any preceding claim including a battery located in the support structure between the resonant plate and the electrode.
6. A stethoscope substantially as hereinbefore

scribed with reference to and as shown in the accompanying drawings.

7. In a stethoscope with a conductive resonant plate for touching with a breast portion of a human being having a supporting portion, the improvement comprising an electrode for touching with finger, a circuit board for connecting electrically the conductive resonant plate and the electrode, and a display device for indicating a pulse based on an electrocardiac potential.

8. A stethoscope claimed in claim 7, wherein the display surface of the display device is opposite to the touching surface of the conductive resonant plate.

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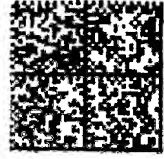
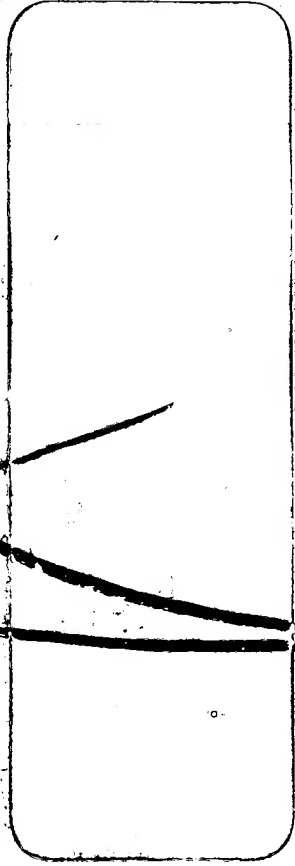
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